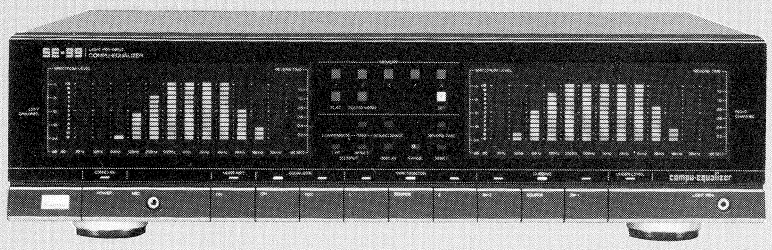
# SERVICE MANUAL

## COMPU-EQUALIZER

# SANSUI SE-99



**CAUTION**

1. Parts identified by the⚠symbol on the schematic diagram and the parts list are critical for safety. Use only replacement parts that have critical characteristics recommended by the manufacturer.
2. Make leakage-current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the appliance to the customer.

Sansui

SANSUI ELECTRIC CO., LTD.

## •SPECIFICATIONS

**Input sensitivity and impedance** (1 kHz)
INPUT, TAPE PLAY-1,2 ..... 150mV/47 kohms
**Output level and impedance** (1 kHz)
TAPE REC-1,2 ..... 150mV/1.5 kohms
OUTPUT ..... 150mV/1.5 kohms
(Maximum output level: 5V into 47 kohms at 0.5% total harmonic distortion)
**Total harmonic distortion** (at 2V, 20 Hz to 20 kHz)
INPUT, TAPE PLAY-1,2 ..... 0.003%
**Frequency response** (at 0.5V, Equalizer curve flat)
INPUT, TAPE PLAY-1,2 ..... 10 Hz to 100 kHz, +1.0 dB, —2.0 dB
**Signal to noise ratio** (Short-circuit, A-network)
INPUT, TAPE PLAY-1,2 ..... 120 dB
**Equalizer frequency** ..... 16 Hz, 32 Hz, 64 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz, 32 kHz
**Level variation range** ..... ±12 dB or ±6 dB

### Others

**Power voltage** ..... 120V, 220V, 240V (50/60 Hz)
For U.S.A. and Canada ..... 120V (60 Hz)
**Power consumption** ..... 25 watts
**Dimensions** ..... 430 mm (16-15/16") (W)
119 mm (4-11/16")(H)
304 mm (11-15/16") (D)
**Weight** ..... 5.3 kg (11.7 lbs) net
6.6 kg (14.6 lbs) packed

* Design and specifications subject to change without notice for improvements.
* Due to local laws and regulations, this unit sold in some areas are not equipped with variable voltage selectors.

# CAUTION

1. The symbols, UL, CSA, SA, BS, UK, EU, AS and XX (EXPORT) on the parts list and the schematic diagram mean followings respectively.

   UL..... Manufactured for U.S.A market.
   (Underwriters Laboratories approved model.)
   CSA..... Manufactured for Canadian market.
   SA..... Manufactured for South African market.
   BS, UK ..... Manufactured for United Kingdom market.
   EU ..... Manufactured for European market.
   AS..... Manufactured for Australian market.
   XX (EXPORT) ..... Standard Version.
   NON MARK ..... Common Parts.

2. Some printed circuit boards are not supplied as the assembled. To separate these in this service manual, the stock No's are not indicated at the ends of the board names. However, the individual parts on the circuit boards are provided by orders.

3. Since some of capacitors and resistors are omitted from parts lists in this service manual, refer to the Common Parts List for capacitors & resistors, which was issued on February 1983.

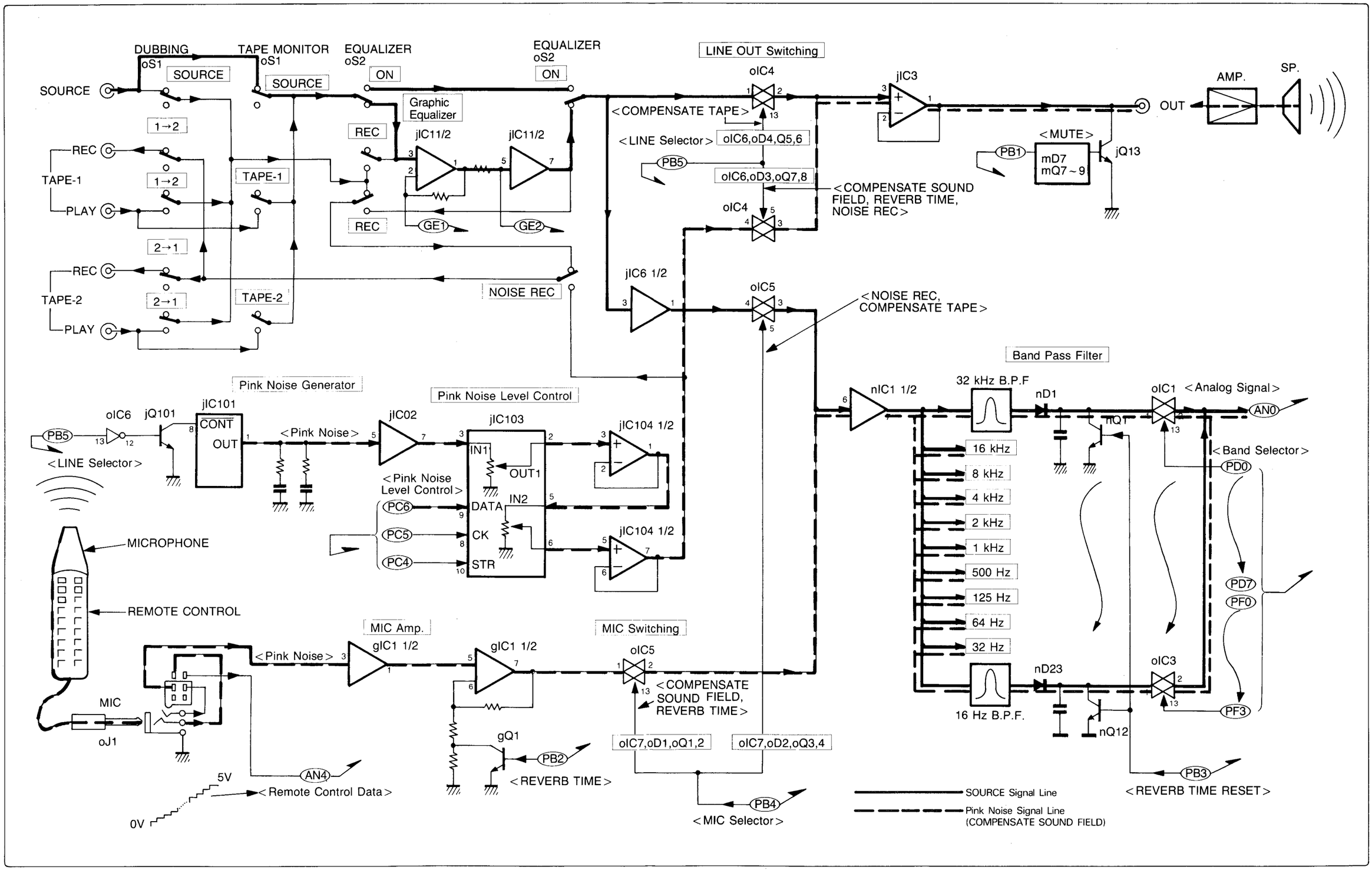
4. Abbreviations in this service manual are as follows.

•Abbreviations List

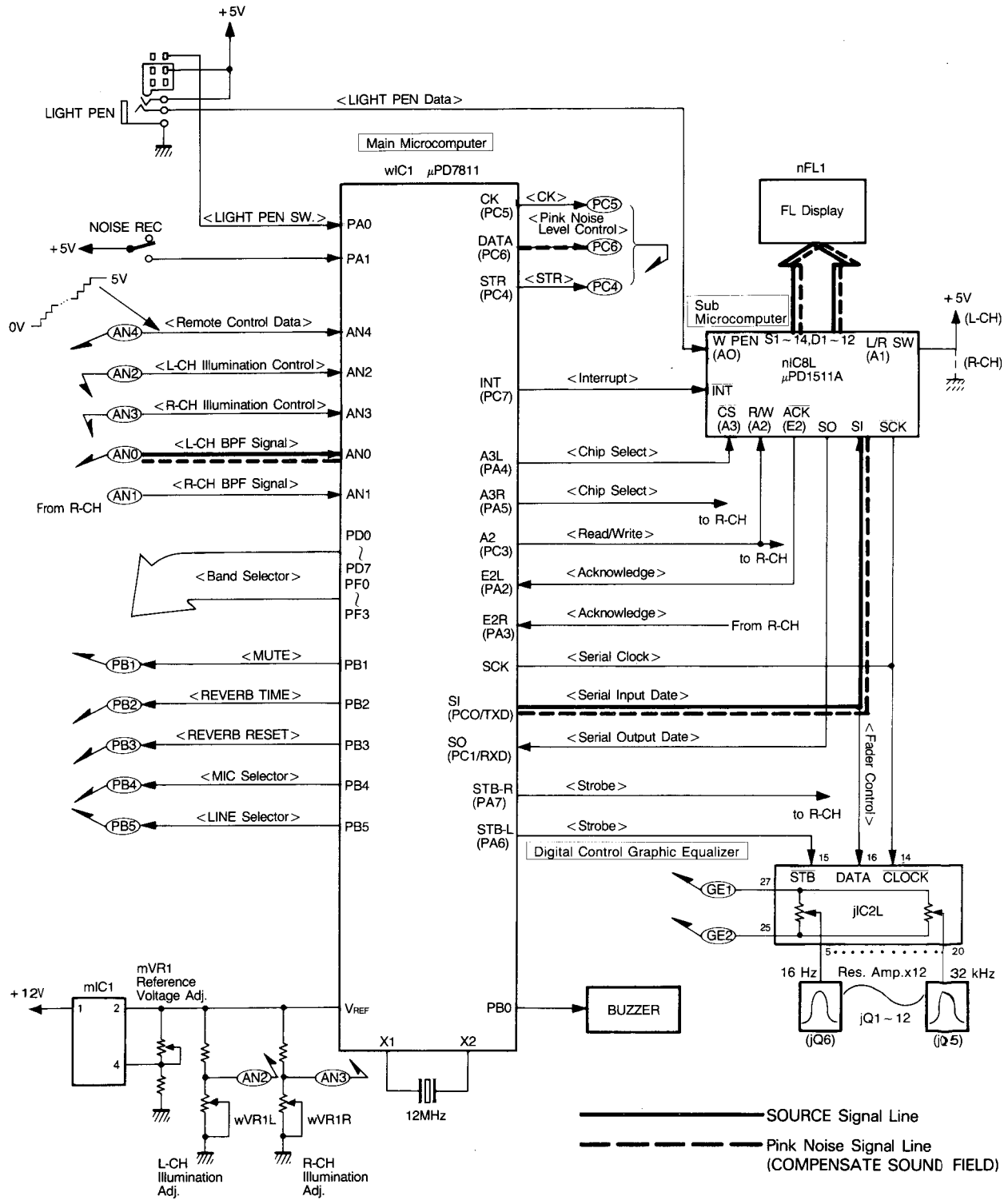
| | | | |
|---|---|---|---|
| C.R. | : Carbon Resistor | E.B.L. | : Low Leak Bi-Polar Electrolytic Capacitor |
| S.R. | : Solid Resistor | | |
| Ce.R. | : Cement Resistor | Ta.C. | : Tantalum Capacitor |
| M.R. | : Metal Film Resistor | F.C. | : Film Capacitor |
| F.R. | : Fusing Resistor | M.P. | : Metalized Paper Capacitor |
| N.I.R. | : Non-Inflammable Resistor | P.C. | : Polystyrene Capacitor |
| A.R. | : Array Resistor | G.C. | : Gimmic Capacitor |
| C.C. | : Ceramic Capacitor | A.C. | : Array Capacitor |
| C.T. | : Ceramic Capacitor, Temperature Compensation | V.R. | : Variable Resistor |
| | | S.V.R. | : Semi Variable Resistor |
| E.C. | : Electrolytic Capacitor | SW. | : Switch |
| E.L. | : Low Leak Electrolytic Capacitor | Chip R. | : Chip Resistor |
| | | Chip C. | : Chip Capacitor |
| E.B. | : Bi-Polar Electrolytic Capacitor | | |

# 1. BLOCK DIAGRAM

## 1-1. Input Source Switching Section



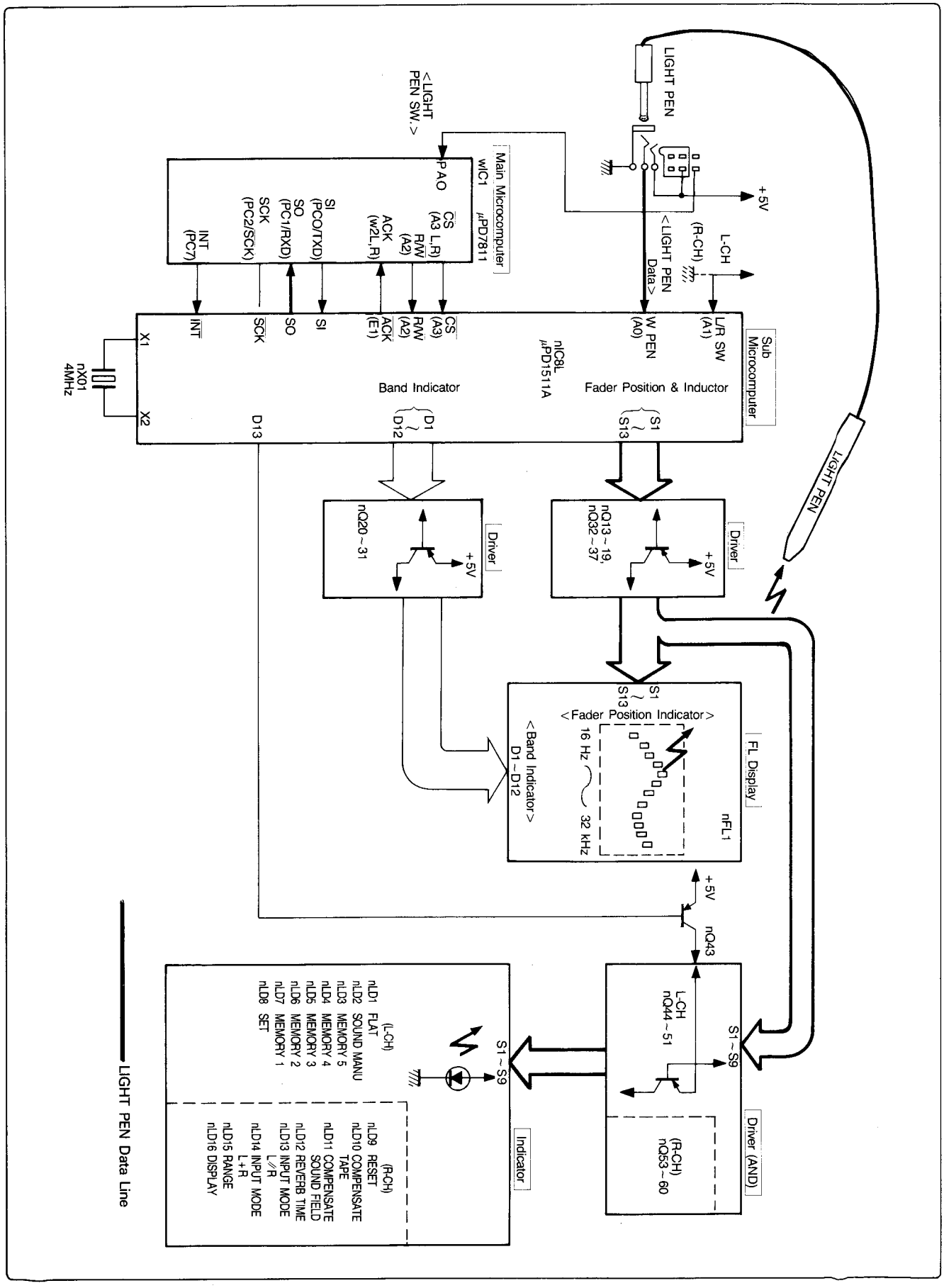
## 1-2. Microcomputer Section




**< Explanation of Various Signals >**

**R/W (Read/Write):** indicate that CPU can read data from external devices (e.g. storage device) or can write data in the external devices.
**INT (Interrupt):** indicates that the current program control is interrupted and shifted temporarily to another program execution in such a state as to be able to execute the current procedure again.
**STB (Strobe):** indicates that a selection signal is outputted when data is correctly transferred to a bus.
**CS (Chip Select):** indicates that a chip is selected.
**ACK (Acknowledge):** indicates that information has already been received, being called a response signal.

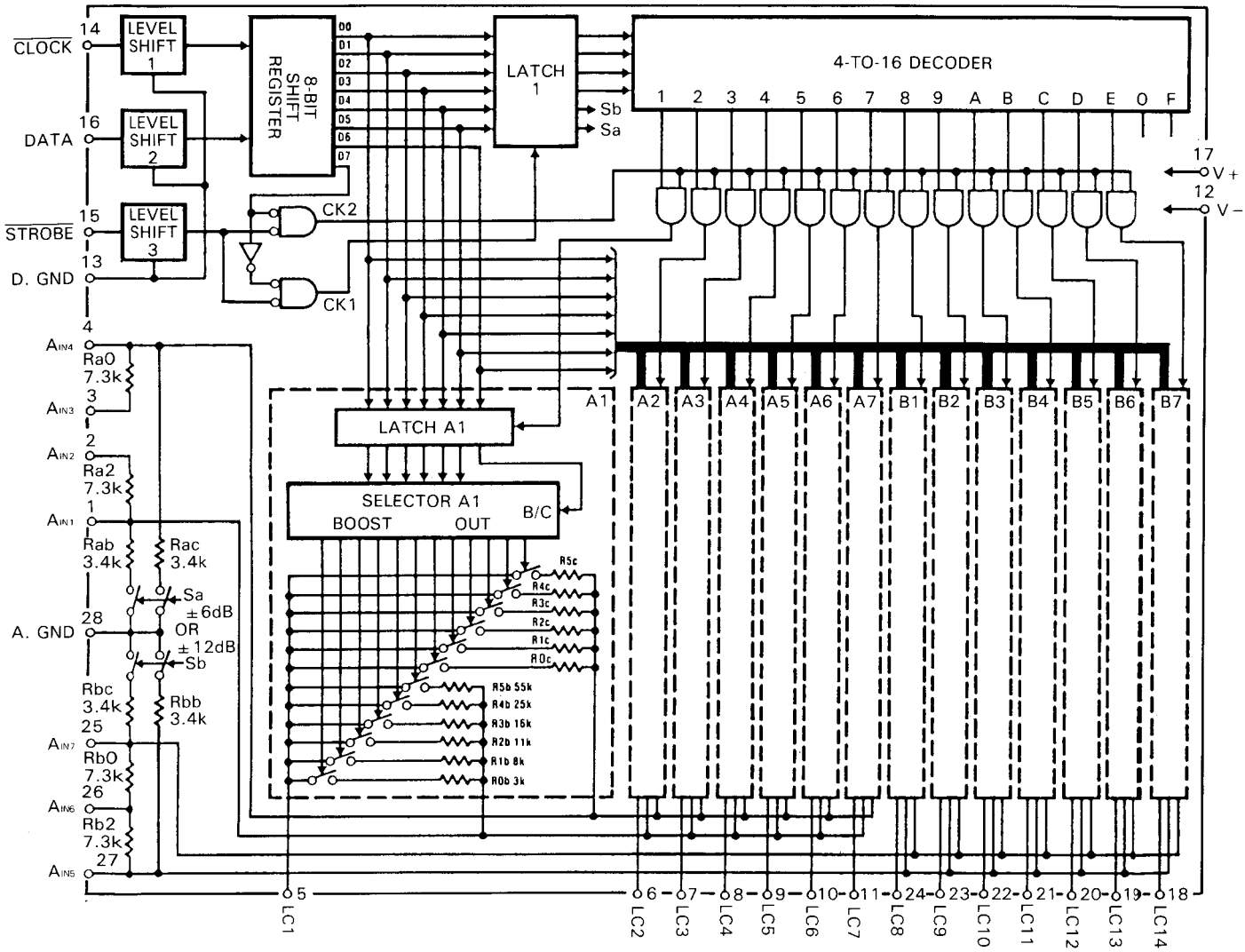
## 1-3. LIGHT PEN Operation



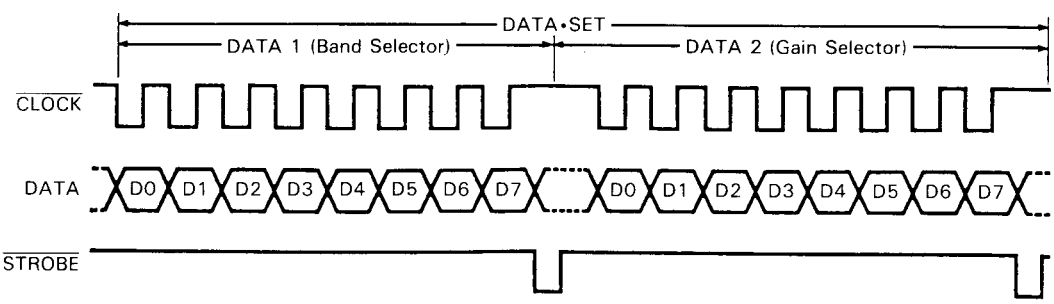
# 2. INTERIOR BLOCK DIAGRAM & TERMINAL FUNCTION OF IC

**•LMC835 (Digital Control Graphic Equalizer)**

**<Block Diagram>**

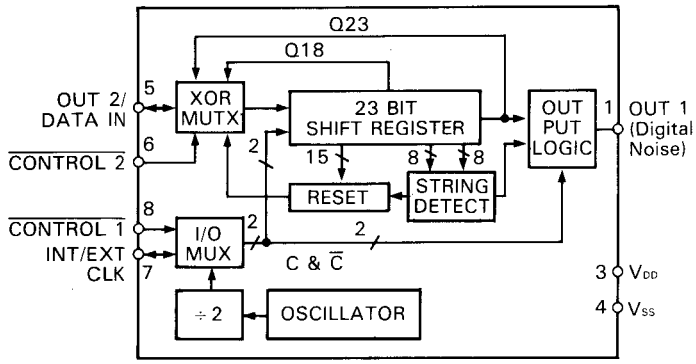



**<Timing Chart>**




* When the gain of the currently selected band is required to change, it is unnecessary to send DATA 1 (band selection).

## •MM5437 (Digital Noise Source) <Block Diagram>

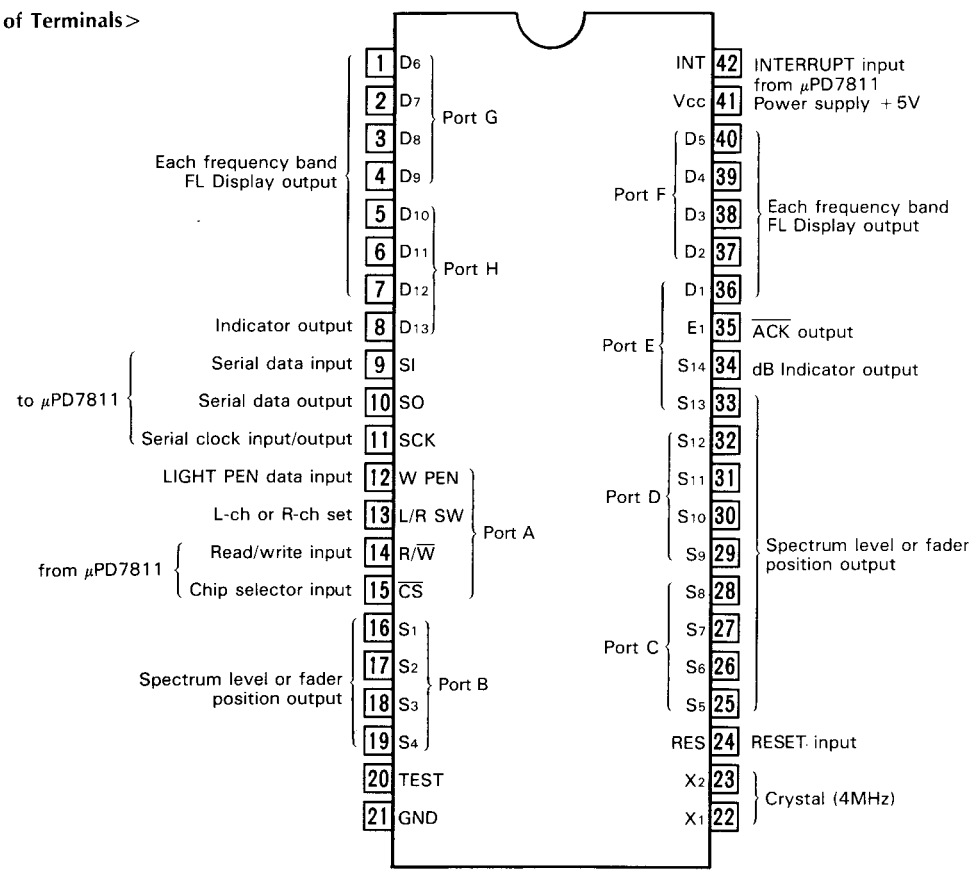



## •TC9176P (Electronic Attenuator)

| Pin No. | Symbols | Description | Remarks |
|---|---|---|---|
| 2<br>15 | L-OUT1<br>R-OUT1 | Output terminals of 10 dB-step attenuator. A signal applied to input terminal (3 or 14) is attenuated by 10dB per step from 0 to 70 dB up to 8 steps. | (L/R)<br>2/15 (OUT)<br>3/14 (IN)<br>4/13 (GND)<br>5/12 (IN)<br>6/11 (OUT) |
| 3<br>14 | L-IN1<br>R-IN1 | Input terminals of 10 dB-step attenuator | |
| 4<br>13 | A-GND | AC ground terminal | |
| 5<br>12 | L-IN2<br>R-IN2 | Input terminals of 2 dB-step attenator | |
| 6<br>11 | L-OUT2<br>R-OUT2 | Output terminals of 2 dB-step attenuator. A signal applied to input terminal (5 or 12) is attenuated by 2 dB per step from 0 to 8 dB up to 5 steps. | |
| 9 | DATA | Input terminal of DATA signal for selecting attenuation step and channel (L or R). DATA signal is composed of 20 bits and inputted in response to CLOCK signal. | *Low threshold input inverter |
| 8 | CK | Input terminal of CLOCK to read data through DATA terminal. | Ditto |
| 10 | ST | Input terminal of STROBE singal DATA signals for selecting attenuation step and channel received through DATA terminal in response to CLOCK are latched when this terminal is set to "H". If not at "H" level, the preceding data are kept as they are. | Ditto |
| 16<br>7<br>1 | VDD<br>GND<br>VSS | Positive supply voltage terminal<br>Ground terminal<br>Negative supply voltage terminal | |

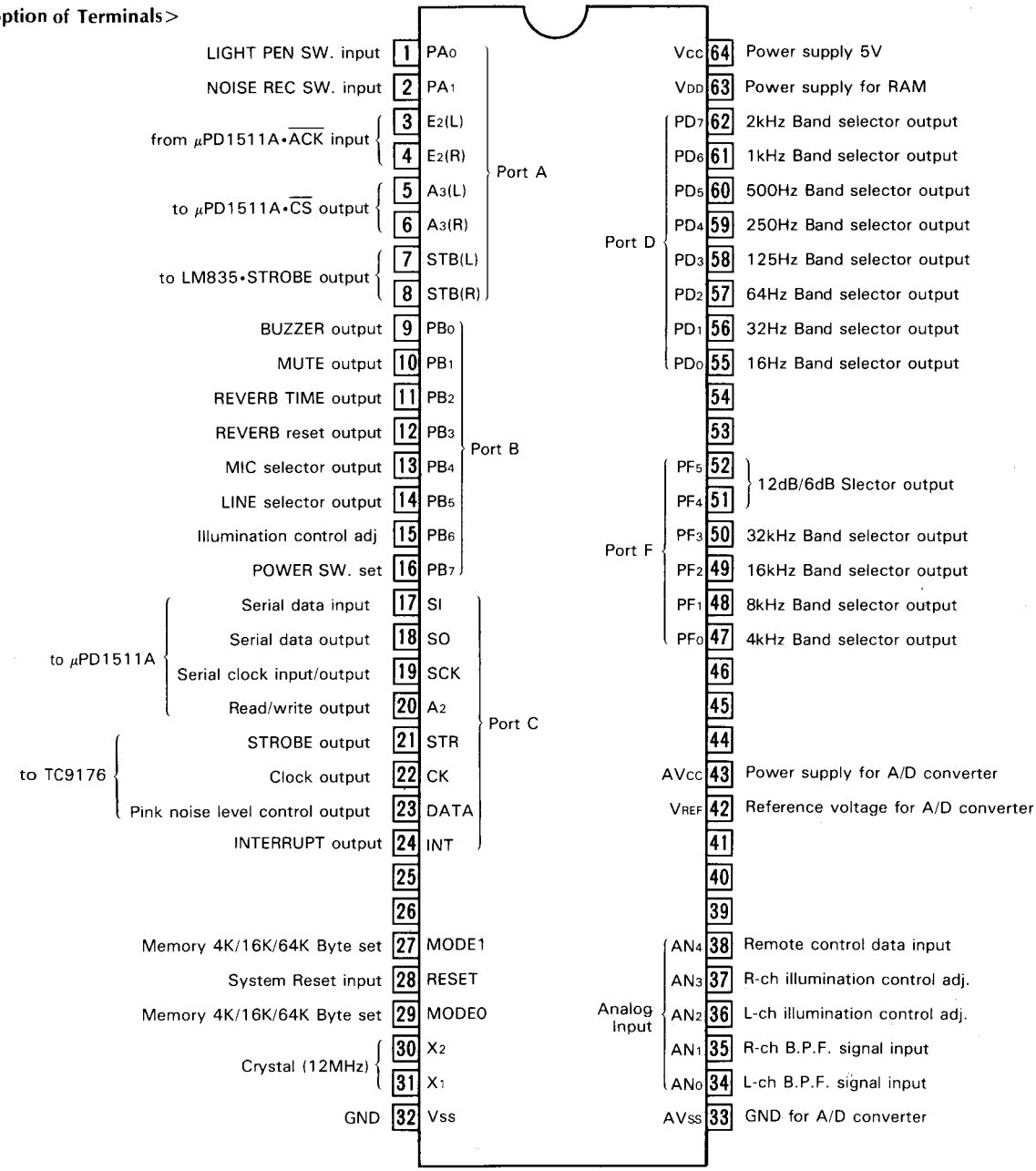
## •μPD1511A (Sub Microcomputer)

<Descroption of Terminals>

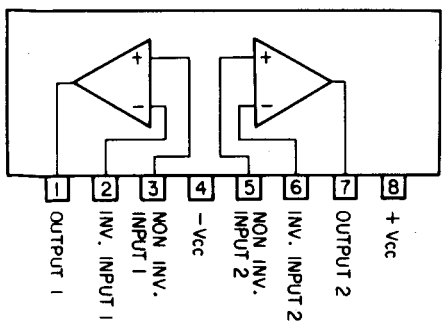


## •μPD7811 (Main Microcomputer)

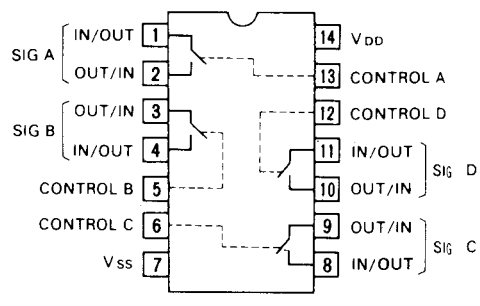
<Descroption of Terminals>


LIGHT PEN SW. input 1 PA0
NOISE REC SW. input 2 PA1
from μPD1511A•ACK input 3 E2(L)
4 E2(R)
to μPD1511A•CS output 5 A3(L)
6 A3(R)
Port A
to LM835•STROBE output 7 STB(L)
8 STB(R)
BUZZER output 9 PB0
MUTE output 10 PB1
REVERB TIME output 11 PB2
REVERB reset output 12 PB3
MIC selector output 13 PB4
LINE selector output 14 PB5
Illumination control adj 15 PB6
POWER SW. set 16 PB7
Port B
to μPD1511A Serial data input 17 SI
Serial data output 18 SO
Serial clock input/output 19 SCK
Read/write output 20 A2
to TC9176 STROBE output 21 STR
Clock output 22 CK
Pink noise level control output 23 DATA
INTERRUPT output 24 INT
Port C
25
26
Memory 4K/16K/64K Byte set 27 MODE1
System Reset input 28 RESET
Memory 4K/16K/64K Byte set 29 MODE0
Crystal (12MHz) 30 X2
31 X1
GND 32 Vss
Vcc 64 Power supply 5V
VDD 63 Power supply for RAM
PD7 62 2kHz Band selector output
PD6 61 1kHz Band selector output
PD5 60 500Hz Band selector output
PD4 59 250Hz Band selector output
Port D
PD3 58 125Hz Band selector output
PD2 57 64Hz Band selector output
PD1 56 32Hz Band selector output
PD0 55 16Hz Band selector output
54
53
PF5 52
PF4 51
12dB/6dB Slector output
PF3 50 32kHz Band selector output
Port F
PF2 49 16kHz Band selector output
PF1 48 8kHz Band selector output
PF0 47 4kHz Band selector output
46
45
44
AVcc 43 Power supply for A/D converter
VREF 42 Reference voltage for A/D converter
41
40
39
AN4 38 Remote control data input
AN3 37 R-ch illumination control adj.
Analog Input
AN2 36 L-ch illumination control adj.
AN1 35 R-ch B.P.F. signal input
AN0 34 L-ch B.P.F. signal input
AVss 33 GND for A/D converter

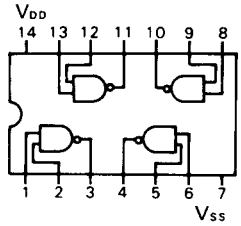
## •M5218L, M5220L (Pre Amp.)



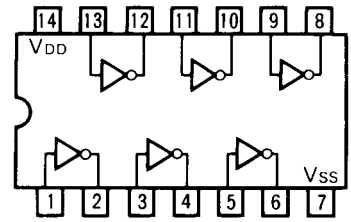

## •LC4066BH, μPD4066BC (Quad Bi-lateral SW.)



•$\mu$PD4011BC (Quad NAND)




•BU4069UB, $\mu$PD4069UBC, TC4069UBC (Hexad Inverter)




# 3. ADJUSTMENT

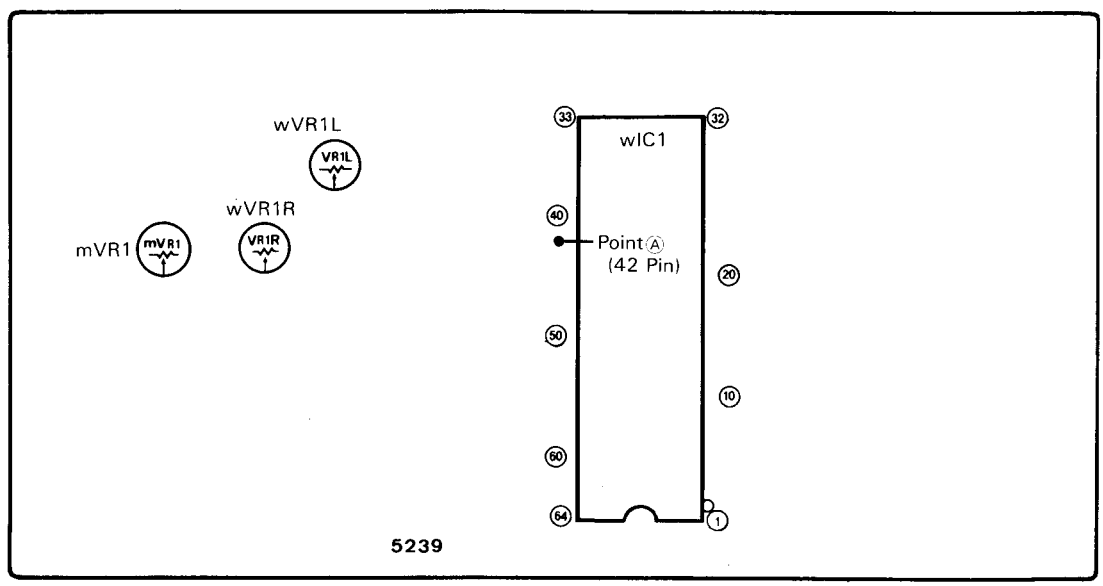
## 3-1. Reference Voltage Adjustment (See Fig. 3-1)

1. Connect a DC voltmeter between point Ⓐ (Pin 42 of wIC) and GND.
2. Adjust the voltage to 5V ± 0.1V by turning mVR1 on board F-5239.

## 3-2. Luminance Adjustment of FL Display Tubes (See Fig. 3-1)

1. Set the fader position to DISPLAY.
2. Rotate wVR1L and wVR1R on board F-5239 clockwise to their extreme ends.
3. When the left-hand FL display tube is dim, adjust the wVR1L; when the right-hand FL display tube is dim, adjust the wVR1R. Further adjust these display tubes so that both the tubes balance with each other in luminance.

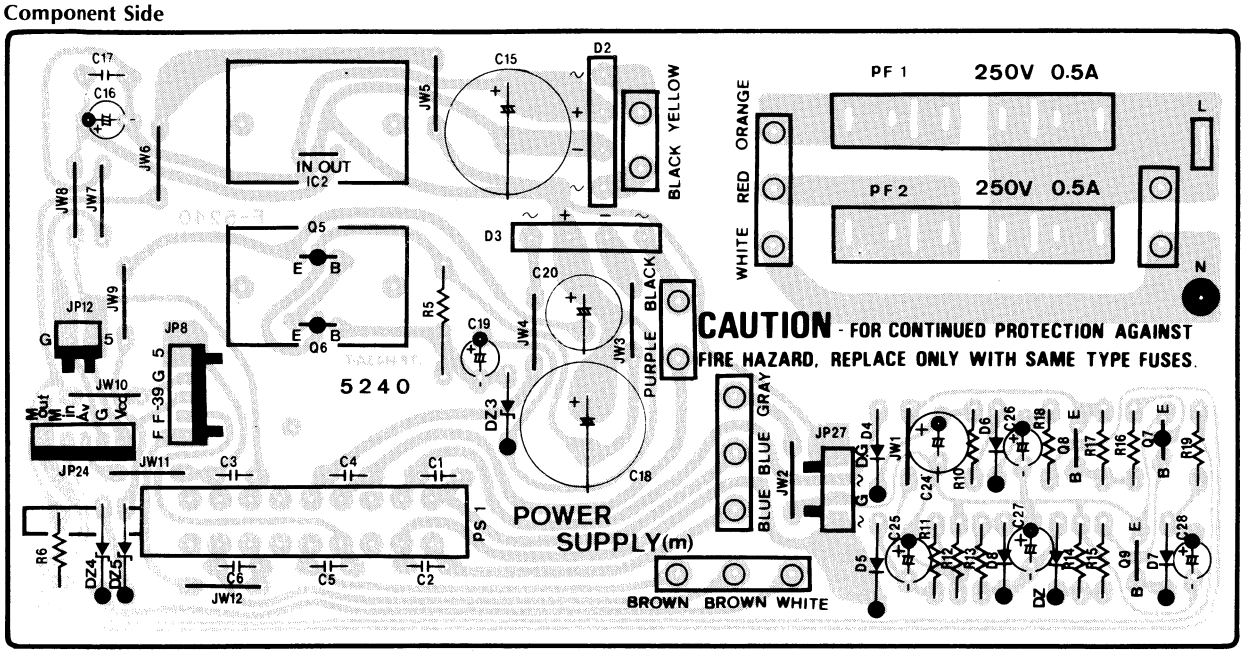
**Fig. 3-1 F-5239 Main Microcomputer Board**



# 4. PARTS LOCATION & PARTS LIST

## 4-1. F-5240 Power Supply Board (Stock No. 00951401)

**Component Side**




**Parts List**

| Parts No. | Stock No. | Description |
|---|---|---|
| •Transistor | | |
| ⚠mQ5 | 48150701 | 2SB834 |
| ⚠mQ6 | 46367001 | 2SA1115 |
| ⚠ | or 46367201 | 2SA1048 |
| ⚠ | or 48058601 | 2SA933S |
| mQ7 | 46367001 | 2SA1115 |
| | or 46367201 | 2SA1048 |
| | or 48058601 | 2SA933S |
| mQ8 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| mQ9 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| •IC | | |
| ⚠mIC2 | 46720300 | μPC7805H |
| ⚠ | or 48053500 | NJM7805A |
| •Diode | | |
| ⚠mD2 | 03117000 | RB152-LFF |
| ⚠mD4 | 03117700 | 10E-2 |

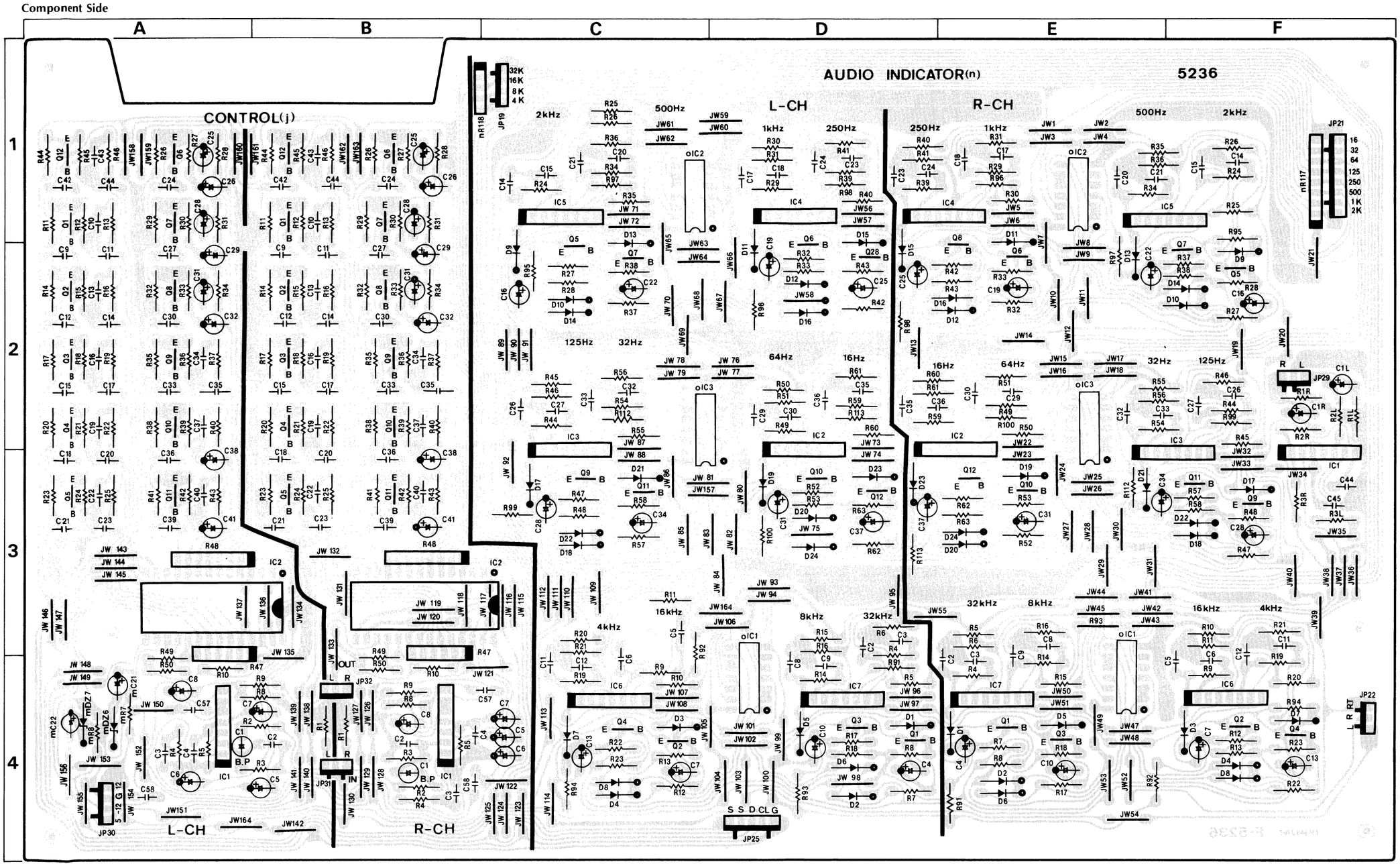
| Parts No. | Stock No. | Description |
|---|---|---|
| ⚠mD5 | 03117700 | 10E-2 |
| mD6 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| mD7 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| •Zener Diode | | |
| mDZ3 | 46117400 | 05Z39-X |
| | or 46117500 | 05Z39-Y |
| | or 46117600 | 05Z39-Z |
| mDZ4 | 03167300 | RD3.0F-B |
| mDZ5 | 03167300 | RD3.0F-B |
| mDZ9 | 46111800 | 05Z6.2-Y |
| ⚠mR5 | 46251000 | 2.7kΩ 1W N.I.R. |
| ⚠mR10 | 46229400 | 220Ω 1/2W N.I.R. |
| ⚠pF1 | 48266400 | AC Fuse 0.5A 250V (XX) |
| ⚠ | 48266500 | AC Fuse 0.8A 250V (UL,CSA) |
| ⚠pF2 | 48266400 | AC Fuse 0.5A 250V (XX) |
| ⚠pS1 | 48349200 | Push SW., POWER |

## 4-2. F-5236 Graphic Equalizer Board (Stock No. 00951201)

**Parts List**

| Parts No. | Stock No. | Description |
|---|---|---|
| •Transistor | | |
| jQ1 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ2 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ3 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ4 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ5 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ6 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ7 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ8 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ9 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ10 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ11 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| jQ12 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 46577801 | 2SC2320L |
| | or 46581701 | 2SC1845 |
| •IC | | |
| jIC1 | 46078900 | M5218L |
| jIC2 | 48350600 | LMC835N |
| jR47 | 48350800 | 100kΩx5 A.R. |
| jR48 | 46392900 | 100kΩx7 A.R. |
| jC1 | 48103500 | 2.2μF 50V E.B. |
| jC28 | 46698200 | 0.18μF 50V F.C. |
| jC32 | 46937500 | 1.5μF 50V E.B. |
| •Diode | | |
| mD8 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| •Zener Diode | | |
| mDZ6 | 46112400 | 05Z7.5-Y |
| mDZ7 | 46112400 | 05Z7.5-Y |
| ⚠mR7 | 46249200 | 82Ω 1W N.I.R. |
| ⚠mR8 | 46249200 | 82Ω 1W N.I.R. |
| ⚠mR30 | 46228600 | 47Ω 1/2W N.I.R. |
| ⚠mR31 | 46228600 | 47Ω 1/2W N.I.R. |
| •Transistor | | |
| nQ1 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ2 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ3 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ4 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ5 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ6 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ7 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ8 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ9 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ10 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ11 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| nQ12 | 46367101 | 2SC2603 |
| | or 46367301 | 2SC2458 |
| | or 48058801 | 2SC1740S |
| •IC | | |
| nIC1 | 46078900 | M5218L |
| nIC2 | 46078900 | M5218L |
| nIC3 | 46078900 | M5218L |
| nIC4 | 46078900 | M5218L |
| nIC5 | 46078900 | M5218L |
| nIC6 | 46078900 | M5218L |
| nIC7 | 46078900 | M5218L |
| •Diode | | |
| nD1 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD2 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD3 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD4 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD5 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD6 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD7 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD8 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD9 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD10 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD11 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD12 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD13 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD14 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |

Component Side




Parts List <F-5236>

| Parts No. | Stock No. | Description |
|---|---|---|
| nD15 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD16 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD17 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD18 | 03117600 | 1S2473T77 |

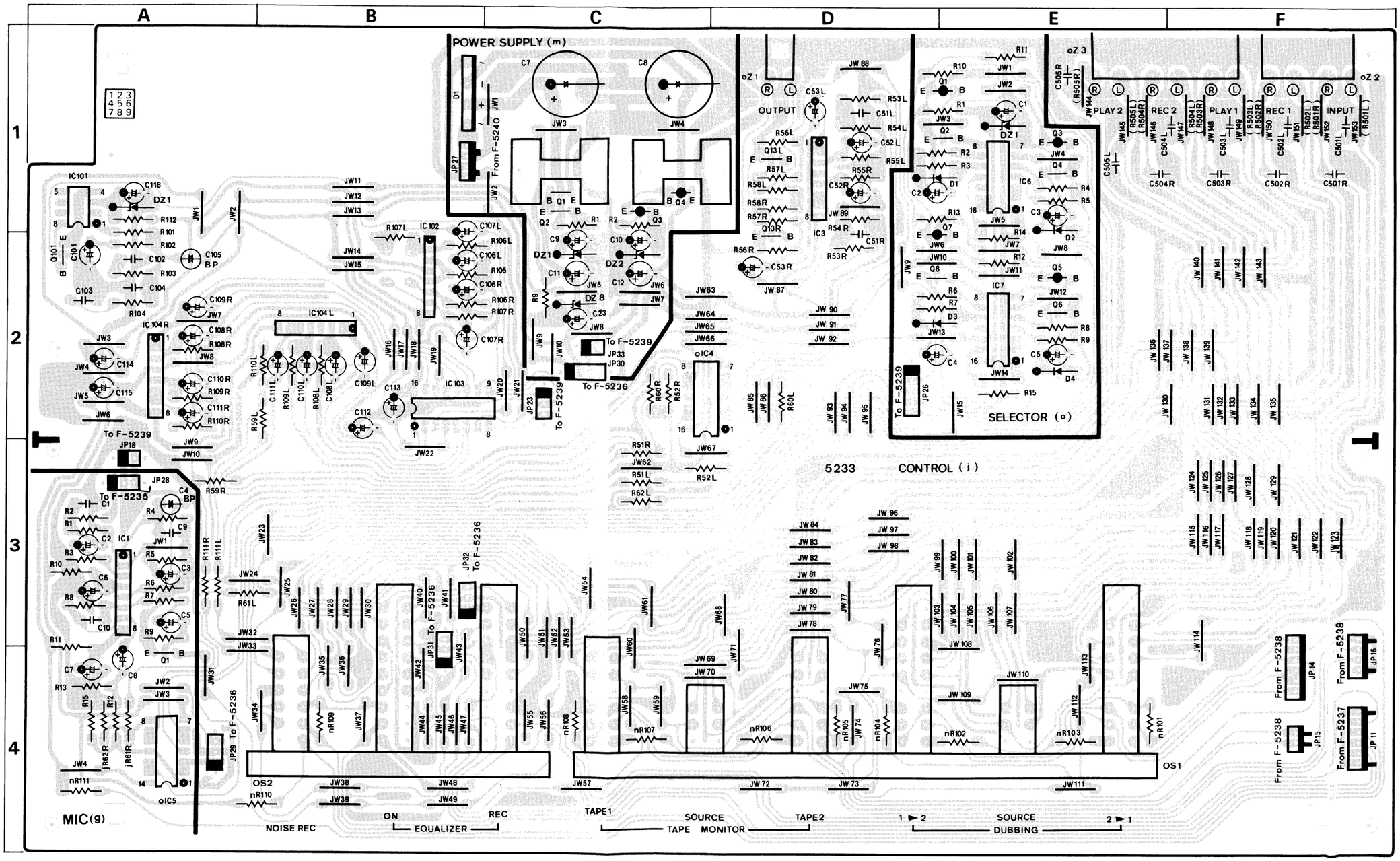
| Parts No. | Stock No. | Description |
|---|---|---|
| | or 46086000 | 1S1588TP-3 |
| nD19 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD20 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD21 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |

| Parts No. | Stock No. | Description |
|---|---|---|
| nD22 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD23 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD24 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| nD26 | 03111600 | 1S2473 |

| Parts No. | Stock No. | Description |
|---|---|---|
| nR117 | 46350500 | 100kΩX8 1/8W A.R. |
| nR118 | 46343100 | 100kΩX4 1/8W A.R. |
| •IC | | |
| oIC1 | 46255000 | LC4066BH |
| oIC2 | 46255000 | LC4066BH |
| oIC3 | 46255000 | LC4066BH |

## 4-3. F-5233 Input Source Switching Board (Stock No. 00950601)

Component Side



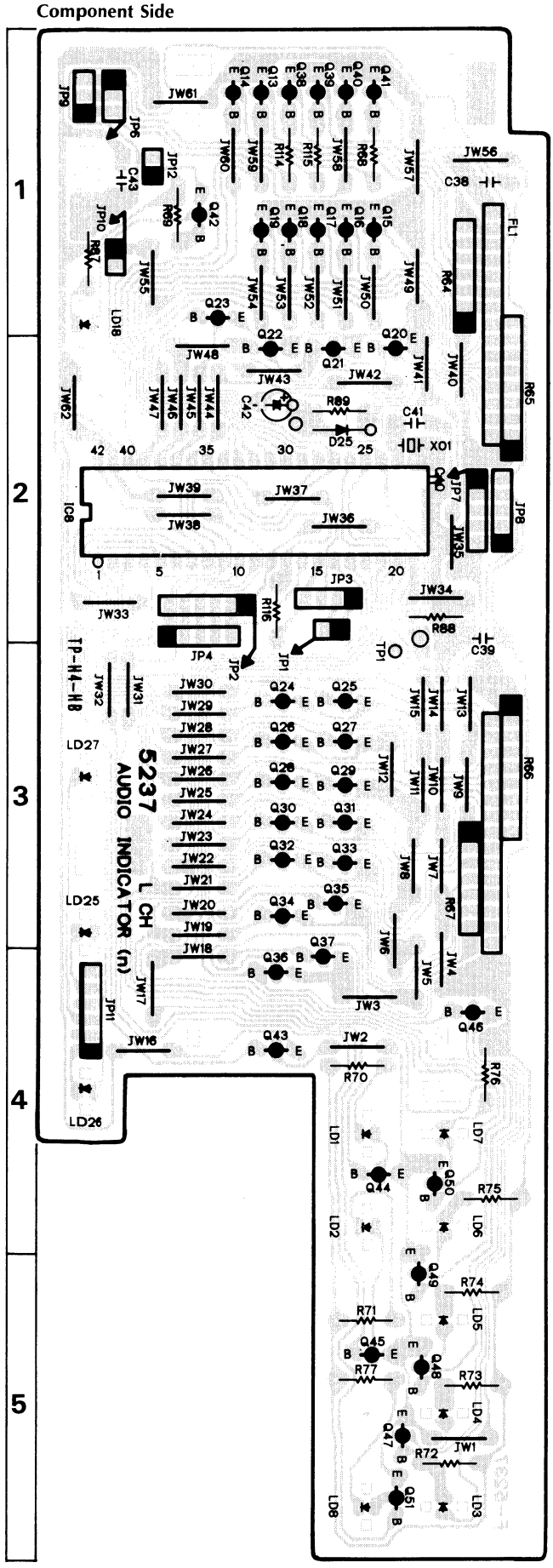
**Parts List <F-5233>**

| Parts No. | Stock No. | Description |
|---|---|---|
| •Transistor | | |
| gQ1 | 48223100 | DTC114TS |
| •IC | | |
| gIC1 | 46288800 | M5220L |
| ⚠gR10 | 46228600 | 47Ω 1/2W N.I.R. |
| ⚠gR11 | 46228600 | 47Ω 1/2W N.I.R. |
| gC4 | 48103400 | 1μF 50V E.B. |
| •Transistor | | |
| jQ13 | 46604301 | 2SC3327 |
| jQ101 | 48223100 | DTC114TS |
| •IC | | |
| jIC3 | 46078900 | M5218L |
| jIC101 | 48350700 | MM5437N |
| jIC102 | 46078900 | M5218L |
| jIC103 | 48348000 | TC9176P |
| jIC104 | 46078900 | M5218L |
| •Zener Diode | | |
| jDZ1 | 46111100 | 05Z5.1-X |
| | or 46111200 | 05Z5.1-Y |
| | or 46111300 | 05Z5.1-Z |
| jC102 | 46893400 | 0.27μF 100V F.C. |
| jC103 | 46697400 | 0.082μF 50V F.C. |
| jC104 | 46696800 | 0.047μF 50V F.C. |
| jC105 | 48103400 | 1μF 50V E.B. |
| •Transistor | | |
| ⚠mQ1 | 03083901 | 2SD313AL |
| ⚠ | or 48369801 | 2SC1826 |
| ⚠mQ2 | 46367101 | 2SC2603 |
| ⚠ | or 46367301 | 2SC2458 |
| ⚠ | or 48058801 | 2SC1740S |
| ⚠mQ3 | 46367001 | 2SA1115 |
| ⚠ | or 46367201 | 2SA1048 |
| ⚠ | or 48058601 | 2SA933S |
| ⚠mQ4 | 48150701 | 2SB834 |
| •Diode | | |
| ⚠mD1 | 03117000 | RB152-LFF |
| •Zener Diode | | |
| mDZ1 | 46113000 | 05Z9.1-Y |
| | or 46113100 | 05Z9.1-Z |
| mDZ2 | 46113000 | 05Z9.1-Y |
| | or 46113100 | 05Z9.1-Z |
| mDZ8 | 46111500 | 05Z5.6-Y |
| ⚠mR1 | 46230100 | 820Ω 1/2W N.I.R. |
| ⚠mR2 | 46230100 | 820Ω 1/2W N.I.R. |
| ⚠mR9 | 46249200 | 82Ω 1W N.I.R. |
| •Transistor | | |
| oQ1 | 48230000 | DTA143XS |
| oQ2 | 48223100 | DTC114TS |
| oQ3 | 48230000 | DTA143XS |
| oQ4 | 48223100 | DTC114TS |
| oQ5 | 48230000 | DTA143XS |
| oQ6 | 48223100 | DTC114TS |
| oQ7 | 48230000 | DTA143XS |
| oQ8 | 48223100 | DTC114TS |
| •IC | | |
| oIC4 | 46421000 | μPD4066BC |
| oIC5 | 46421000 | μPD4066BC |
| oIC6 | 07107600 | TC4069UBP |
| | or 46427000 | μPD4069UBC |
| | or 48063900 | BU4069UB |

| Parts No. | Stock No. | Description |
|---|---|---|
| oIC7 | 07107600 | TC4069UBP |
| | or 46427000 | μPD4069UBC |
| | or 48063900 | BU4069UB |
| •Diode | | |
| oD1 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| oD2 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| oD3 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| oD4 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| •Zener Diode | | |
| oDZ1 | 46111100 | 05Z5.1-X |
| | or 46111200 | 05Z5.1-Y |
| | or 46111300 | 05Z5.1-Z |
| oS1 | 48346100 | Push SW., TAPE MONITOR |
| oS2 | 48346300 | Push SW., EQUALIZER |
| oZ1 | 46438100 | 2P Terminal, OUTPUT |
| oZ2 | 46363800 | 4P Terminal, INPUT, TAPE-1 REC |
| oZ3 | 46363900 | 6P Pin Terminal, TAPE-1 PLAY, TAPE-2 |

## 4-4. F-5237 FL. Display (L-CH) Board (Stock No. 00951001)

Component Side




### Parts List

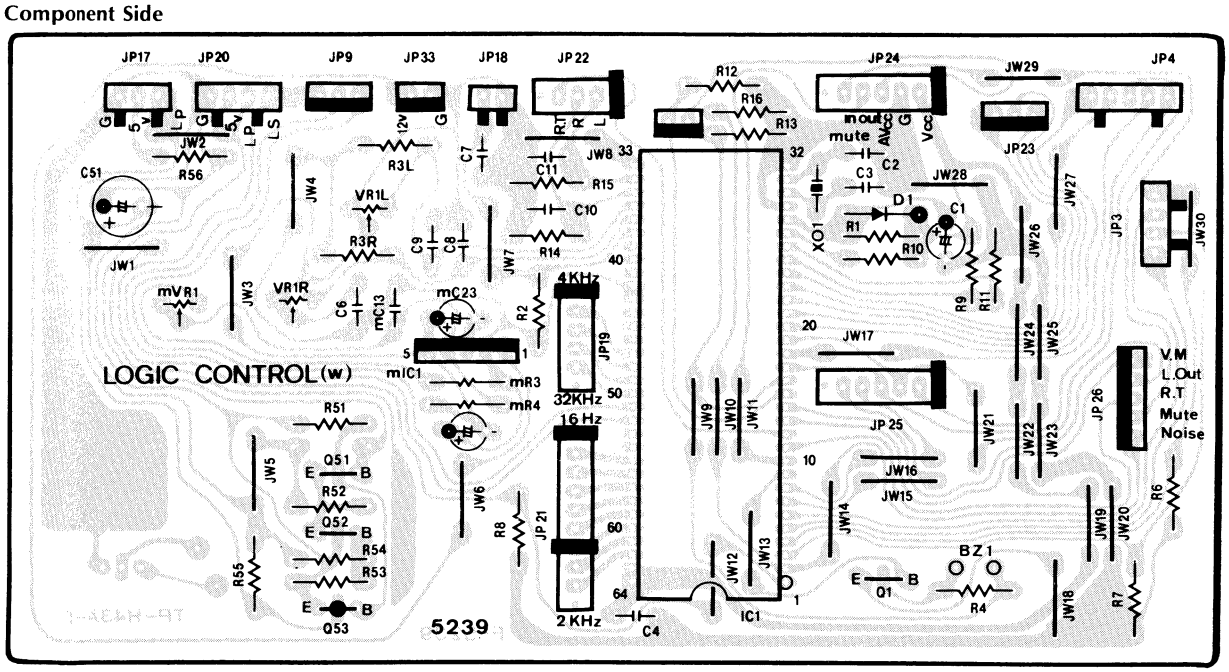
| Parts No. | Stock No. | Description |
|---|---|---|
| •Transistor | | |
| nQ13 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ14 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ15 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ16 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ17 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ18 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ19 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ20 | 48230000 | DTA143XS |
| nQ21 | 48230000 | DTA143XS |
| nQ22 | 48230000 | DTA143XS |
| nQ23 | 48230000 | DTA143XS |
| nQ24 | 48230000 | DTA143XS |
| nQ25 | 48230000 | DTA143XS |
| nQ26 | 48230000 | DTA143XS |
| nQ27 | 48230000 | DTA143XS |
| nQ28 | 48230000 | DTA143XS |
| nQ29 | 48230000 | DTA143XS |
| nQ30 | 48230000 | DTA143XS |
| nQ31 | 48230000 | DTA143XS |
| nQ32 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ33 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ34 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ35 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ36 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ37 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ38 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ39 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ40 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ41 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ42 | 46367001 | 2SA1115 |
| | or 46367201 | 2SA1048 |
| | or 48058601 | 2SA933S |
| nQ43 | 48230000 | DTA143XS |
| nQ44 | 48229400 | DTA114TS |
| nQ45 | 48229400 | DTA114TS |
| nQ46 | 48229400 | DTA114TS |
| nQ47 | 48229400 | DTA114TS |
| nQ48 | 48229400 | DTA114TS |
| nQ49 | 48229400 | DTA114TS |
| nQ50 | 48229400 | DTA114TS |
| nQ51 | 48229400 | DTA114TS |
| •IC | | |
| nIC8 | 48348100 | μPD1511AC-088 |
| nOX1 | 48241600 | Ceramic OSC Element KBR 4.0MS |
| •Diode | | |
| nD25 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| •Zener Diode | | |
| nDZ1 | 46115500 | 05Z20-Z |
| nDZ2 | 46115500 | 05Z20-Z |
| nDZ3 | 46115500 | 05Z20-Z |

Parts List <F-5237>

| Parts No. | Stock No. | Description |
|---|---|---|
| nDZ4 | 46115500 | 05Z20-Z |
| nDZ5 | 46115500 | 05Z20-Z |
| nDZ6 | 46115500 | 05Z20-Z |
| nDZ7 | 46115500 | 05Z20-Z |
| nDZ8 | 46115500 | 05Z20-Z |
| nDZ9 | 46115500 | 05Z20-Z |
| nDZ10 | 46115500 | 05Z20-Z |
| nDZ11 | 46115500 | 05Z20-Z |
| nDZ12 | 46105300 | 05Z20-Z |
| nDZ13 | 46115500 | 05Z20-Z |
| nDZ14 | 46115500 | 05Z20-Z |
| nDZ15 | 46115500 | 05Z20-Z |
| nDZ16 | 46115500 | 05Z20-Z |
| nDZ17 | 46115500 | 05Z20-Z |
| nFL1 | 48351700 | FL. Display CP1062 |
| •LED | | |
| nLD1 | 48385400 | TLUY163, FLAT |
| nLD2 | 48385400 | TLUY163, SOUND MANU |
| nLD3 | 48385400 | TLUY163, MEMORY 5 |
| nLD4 | 48385400 | TLUY163, MEMORY 4 |
| nLD5 | 48385400 | TLUY163, MEMORY 3 |
| nLD6 | 48385400 | TLUY163, MEMORY 2 |
| nLD7 | 48385400 | TLUY163, MEMORY 1 |
| nLD8 | 46176900 | TLS-123, SET |
| nLD18 | 46176900 | TLS-123, STAND BY |
| nLD25 | 46176900 | TLS-123, EQUALIZER (ON) |
| nLD26 | 46176900 | TLS-123, EQUALIZER (REC) |
| nLD27 | 46176900 | TLS-123, NOISE REC |
| nR64 | 46346800 | 100kΩX6 1/8W A.R. |
| nR65 | 46350500 | 100kΩX8 1/8W A.R. |
| nR66 | 46350500 | 100kΩX8 1/8W A.R. |
| nR67 | 46346800 | 100kΩX6 1/8W A.R. |
| nC42 | 46713300 | 1μF 50V E.C. |

## 4-5. F-5239 Main Microcomputer Board (Stock No. 00951301)

Component Side

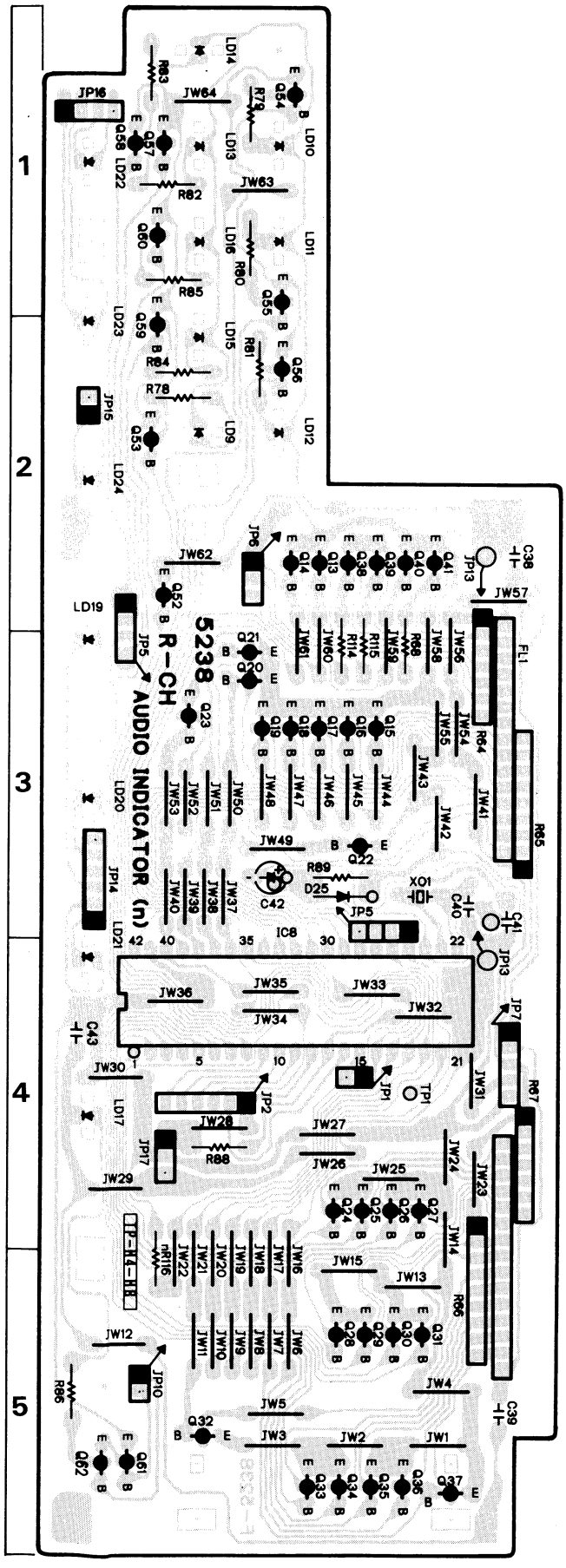



Parts List

| Parts No. | Stock No. | Description |
|---|---|---|
| •IC | | |
| ⚠mIC1 | 48347300 | M5231L |
| mVR1 | 48079000 | 4.7kΩ S.V.R., Reference Voltage Adj. |
| •Transistor | | |
| wQ1 | 48223100 | DTC114TS |
| •IC | | |
| wIC1 | 48348200 | μPD7811CW-621 |
| wOX1 | 48347400 | Quartz Element KBR12.0M |
| •Diode | | |
| wD1 | 03117600 or 46086000 | 1S2473T77 1S1588TP-3 |
| wD2 | 03111600 | 1S2473 |
| wBZ1 | 07244900 | Buzzer PKM12-4A2 |
| wVR1L | 48079000 | 4.7kΩ S.V.R., L-ch Illumination Adj. |
| wVR1R | 48079000 | 4.7kΩ S.V.R., R-ch Illumination Adj. |

## 4-6. F-5238 FL. Display (R-CH) Board (Stock No. 00951101)

Component Side




**Parts List**

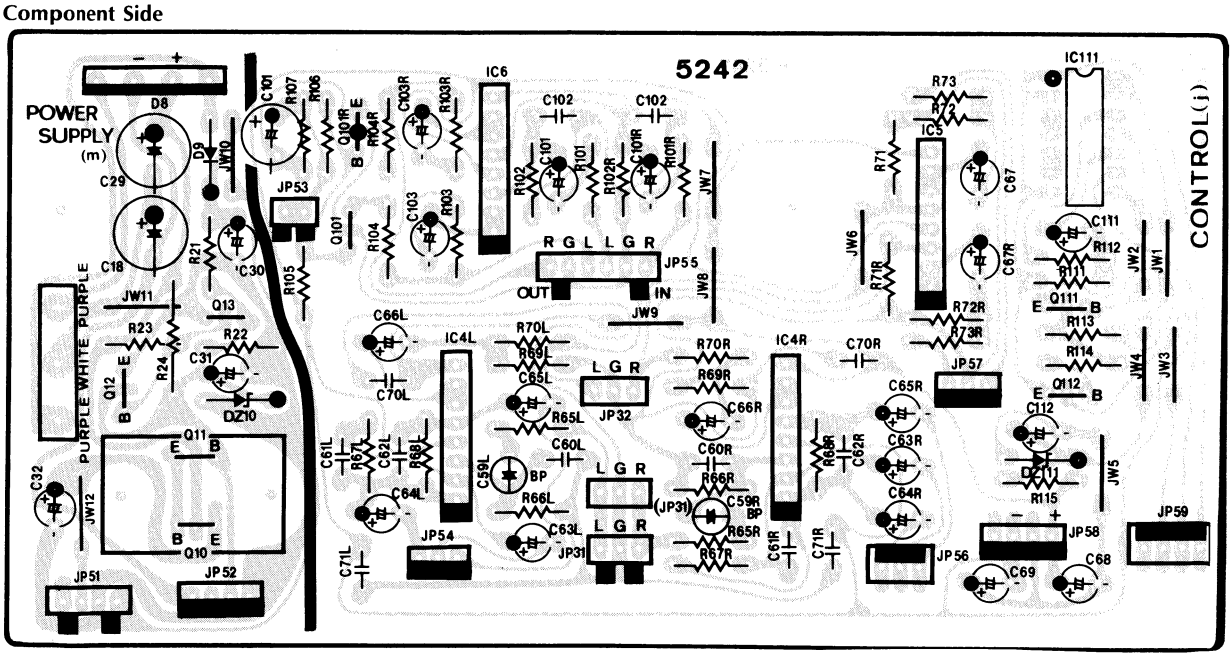
| Parts No. | Stock No. | Description |
|---|---|---|
| •Transistor | | |
| nQ13 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ14 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ15 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ16 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ17 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ18 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ19 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ20 | 48230000 | DTA143XS |
| nQ21 | 48230000 | DTA143XS |
| nQ22 | 48230000 | DTA143XS |
| nQ23 | 48230000 | DTA143XS |
| nQ24 | 48230000 | DTA143XS |
| nQ25 | 48230000 | DTA143XS |
| nQ26 | 48230000 | DTA143XS |
| nQ27 | 48230000 | DTA143XS |
| nQ28 | 48230000 | DTA143XS |
| nQ29 | 48230000 | DTA143XS |
| nQ30 | 48230000 | DTA143XS |
| nQ31 | 48230000 | DTA143XS |
| nQ32 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ33 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ34 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ35 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ36 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ37 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ38 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ39 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ40 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ41 | 48389600 | DTA143XS |
| | or 48390100 | BN1A4M |
| nQ52 | 48230000 | DTA143XS |
| nQ53 | 48229400 | DTA114TS |
| nQ54 | 48229400 | DTA114TS |
| nQ55 | 48229400 | DTA114TS |
| nQ56 | 48229400 | DTA114TS |
| nQ57 | 48229400 | DTA114TS |
| nQ58 | 48229400 | DTA114TS |
| nQ59 | 48229400 | DTA114TS |
| nQ60 | 48229400 | DTA114TS |
| nQ61 | 48230000 | DTA143XS |
| nQ62 | 48229400 | DTA114TS |
| nQ63 | 48229400 | DTA114TS |
| •IC | | |
| nIC8 | 48348100 | μPD1511AC-088 |
| nOX1 | 48241600 | Ceramic OSC Element KBR 4.0MS |
| •Diode | | |
| nD25 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| •Zener Diode | | |
| nDZ1 | 46115500 | 05Z20-Z |
| nDZ2 | 46115500 | 05Z20-Z |
| nDZ3 | 46115500 | 05Z20-Z |
| nDZ4 | 46115500 | 05Z20-Z |
| nDZ5 | 46115500 | 05Z20-Z |
| nDZ6 | 46115500 | 05Z20-Z |
| nDZ7 | 46115500 | 05Z20-Z |

Parts List <F-5238>

| Parts No. | Stock No. | Description |
|---|---|---|
| nDZ8 | 46115500 | 05Z20-Z |
| nDZ9 | 46115500 | 05Z20-Z |
| nDZ10 | 46115500 | 05Z20-Z |
| nDZ11 | 46115500 | 05Z20-Z |
| nDZ12 | 46115500 | 05Z20-Z |
| nDZ13 | 46115500 | 05Z20-Z |
| nDZ14 | 46115500 | 05Z20-Z |
| nDZ15 | 46115500 | 05Z20-Z |
| nDZ16 | 46115500 | 05Z20-Z |
| nDZ17 | 46115500 | 05Z20-Z |
| nFL1 | 48351700 | FL. Display CP1062 |
| •LED | | |
| nLD9 | 48385400 | TLUY163, RESET |
| nLD10 | 48385400 | TLUY163, COMPENSATE TAPE |
| nLD11 | 48385400 | TLUY163, COMPENSATE SOUND FIELD |
| nLD12 | 48385400 | TLUY163, REVERB TIME |
| nLD13 | 48385400 | TLUY163, INPUT MODE L/R |
| nLD14 | 48385400 | TLUY163, INPUT MODE L+R |
| nLD15 | 48385400 | TLUY163, RANGE |
| nLD16 | 48385400 | TLUY163, DISPLAY |
| nLD17 | 46176900 | TLS-123, UNDER LEVEL |
| nLD19 | 46176900 | TLS-123, DUBBING (1 ► 2) |
| nLD20 | 46176900 | TLS-123, DUBBING (SOURCE) |
| nLD21 | 46176900 | TLS-123, DUBBING (2 ► 1) |
| nLD22 | 46176900 | TLS-123, TAPE MONITOR 1 |
| nLD23 | 46176900 | TLS-123, TAPE MONITOR (SOURCE) |
| nLD24 | 46176900 | TLS-123, TAPE MONITOR 2 |
| nR64 | 46346800 | 100kΩX6 1/8W A.R. |
| nR65 | 46350500 | 100kΩX8 1/8W A.R. |
| nR66 | 46350500 | 100kΩX8 1/8W A.R. |
| nR67 | 46346800 | 100kΩX6 1/8W A.R. |
| nC42 | 46713300 | 1μF 50V E.C. |

## 4-7. F-5242 Buffer Amp. Board (Stock No. 00937501)

Component Side

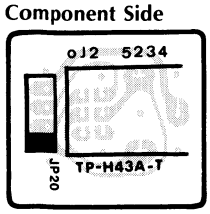



Parts List

| Parts No. | Stock No. | Description |
|---|---|---|
| •Transistor | | |
| jQ121 | 46367001 | 2SA1115 |
| | or 46367201 | 2SA1048 |
| | or 48058601 | 2SA933S |
| jQ151 | 48230000 | DTA143XS |
| jQ152 | 46604301 | 2SC3327 |
| •IC | | |
| jIC4 | 46078900 | M5218L |
| jIC106 | 46078900 | M5218L |
| jIC151 | 46427200 | μPD4011BC |
| •Zener Diode | | |
| jDZ151 | 46111200 | 05Z5.1-Y |
| jC59 | 48103500 | 2.2μF 50V E.B. |
| •Transistor | | |
| ⚠mQ10 | 03083901 | 2SD313AL |
| ⚠mQ11 | 46581701 | 2SC1845 |
| ⚠mQ12 | 46581701 | 2SC1845 |
| ⚠mQ13 | 46581701 | 2SC1845 |
| •Diode | | |
| ⚠mD3 | 03117000 | RB152-LFF |
| mD9 | 03117600 | 1S2473T77 |
| | or 46086000 | 1S1588TP-3 |
| ⚠mR24 | 46251300 | 4.7kΩ 1W N.I.R. |
| •Zener Diode | | |
| mDZ10 | 46116100 | 05Z24-Z |

### 4-8. F-5234 LIGHT PEN Jack Board

**Component Side**

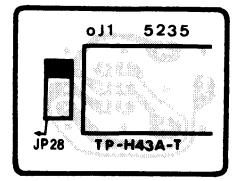



**Parts List**

| Parts No. | Stock No. | Description |
|---|---|---|
| oJ2 | 46271000 | Jack, LIGHT PEN |

### 4-9. F-5235 MIC Jack Board

**Component Side**

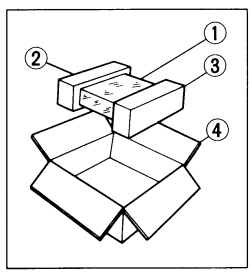



**Parts List**

| Parts No. | Stock No. | Description |
|---|---|---|
| oJ1 | 46271000 | Jack, MIC |

# 5. PACKING LIST

| Parts No. | Stock No. | Description |
|---|---|---|
| 1 | 47859100 | Vinyl Bag |
| 2 | 27047000 | Styrofoam Packing (L) |
| 3 | 27047100 | Styrofoam Packing (R) |
| 4 | 27091600 | Carton Case (SE-99 with RE-99 remote control microphone) |
| | 27111600 | Carton Case (SE-99 with EM-99 condenser microphone) |



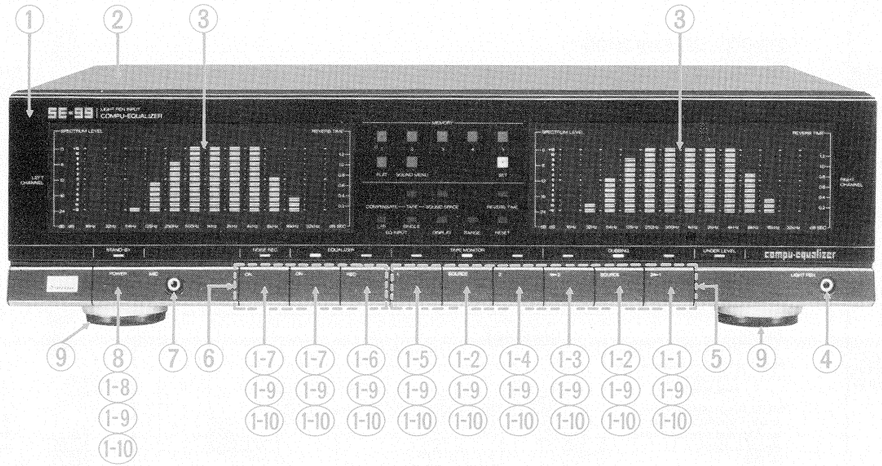

# 6. ACCESSORY LIST

| | Stock No. | Description |
|---|---|---|
| | 07193400 | PJP Cord |
| or | 38103300 | PJP Cord |
| | 46991600 | Operating Instruction (*E·F·S) |
| | 46994400 | Operating Instruction (*G·I·Sw) |
| | 16814000 | COMPU-EQUALIZER LIGHT PEN LP-99 |
| | ——— | REMOTE CONTROL MICROPHONE RE-99 |
| or | ——— | MICROPHONE EM-99 |

***Note:**
**E·F·S:** **E**nglish·**F**rench and **S**panish Version
**G·I·Sw:** **G**erman·**I**talian and **Sw**edish Version

# 7. OTHER PARTS

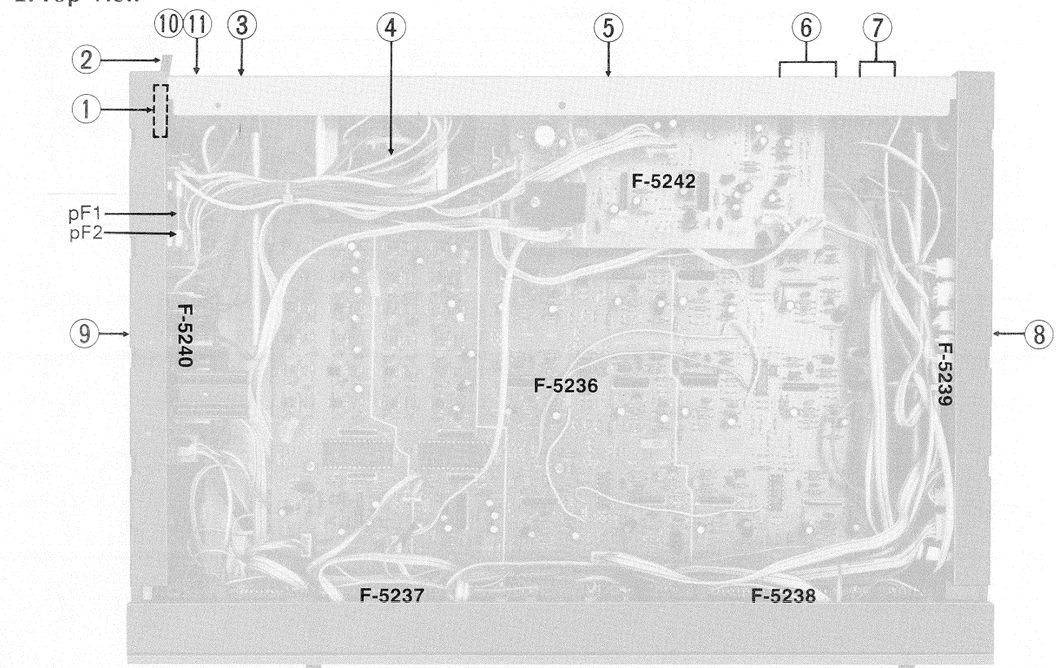
## 7-1. Front View




Parts List

| Parts No. | Stock No. | Description |
|---|---|---|
| 1 | 27093710 | Front Panel Ass'y |
| 1-1 | 27091200 | Knob Cap, 2 ► 1 |
| 1-2 | 27090900 | Knob Cap, SOURCE |
| 1-3 | 27091100 | Knob Cap, 1 ► 2 |
| 1-4 | 27091000 | Knob Cap, 2 |
| 1-5 | 27090800 | Knob Cap, 1 |
| 1-6 | 27090700 | Knob Cap, REC |
| 1-7 | 27090600 | Knob Cap, ON |
| 1-8 | 27090500 | Knob Cap, POWER |
| 1-9 | 27076800 | Push Knob |
| 1-10 | 27091400 | Spring |
| 2 | 47301000 | Bonnet |
| 3 | 48351700 | FL Display |
| 4 | 46271000 | Jack, LIGHT PEN |
| 5 | 48346100 | Push SW., TAPE MONITOR, DUBBING |
| 6 | 48346300 | Push SW., EQUALIZER, NOISE REC |
| 7 | 46271000 | Jack, MIC |
| ⚠8 | 48349200 | Push SW., POWER |
| 9 | 47716600 | Leg Ass'y |

## 7-2. Top View



Parts List

| Parts No. | Stock No. | Description |
|---|---|---|
| 1 | 47157300 | AC Cord Cover |
| ⚠ 2 | 38004700 | Power Supply Cord (XX,UL) |
| ⚠ | 48187800 | Power Supply Cord (CSA) |
| ⚠ | 38004500 | Power Supply Cord (EU) |
| ⚠ 3 | 46364900 | AC OUTLET (XX,UL) |
| ⚠ | 48184000 | AC OUTLET (CSA) |
| ⚠ 4 | 15023402 | Power Transformer (UL,CSA) |
| ⚠ | 15023409 | Power Transformer (XX) |
| ⚠ | 15023405 | Power Transformer (EU) |
| 5 | 46438100 | 2P Terminal, OUTPUT |
| 6 | 46363900 | 6P Terminal, TAPE-1 PLAY, TAPE-2 |
| 7 | 46363800 | 4P Terminal, INPUT, TAPE-1 REC |
| 8 | 47661900 | Side Panel (R) |
| 9 | 47661200 | Side Panel (L) |
| ⚠10 | 07204700 | Slide Switch, VOLTAGE SELECTOR (EU) |
| ⚠11 | 48175200 | Plug, VOLTAGE SELECTOR (XX) |
| ⚠pF1 | 48266500 | AC Fuse 0.8A 250V (UL,CSA) |
| ⚠ | 48266400 | AC Fuse 0.5A 250V (XX) |
| ⚠pF2 | 48266400 | AC Fuse 0.5A 250V (XX) |

# 8. SCHEMATIC DIAGRAM

## 8-1. Input Source Switching Section

* Design and specifications subject to change without notice for improvement.
* La présention et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
* Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

SYMBOL OF FUNCTION
(g) MIC
(j) CONTROL
(m) POWER SUPPLY
(n) AUDIO INDICATOR
(o) SELECTOR
(p) FIXED PARTS
(w) LOGIC CONTROL

RESISTORS
Are in ohms, 1/4 Watts, ±5% Tolerance
Unless Otherwise Noted. k: kΩ, M: MΩ

CAPACITORS
Are in μF, Unless Otherwise Noted. P: pF
Electrolytic Capacitor
Capacitance (μF) / Volt (V)

TOLERANCE
J: ±5%, G: ±2%, F: ±1%

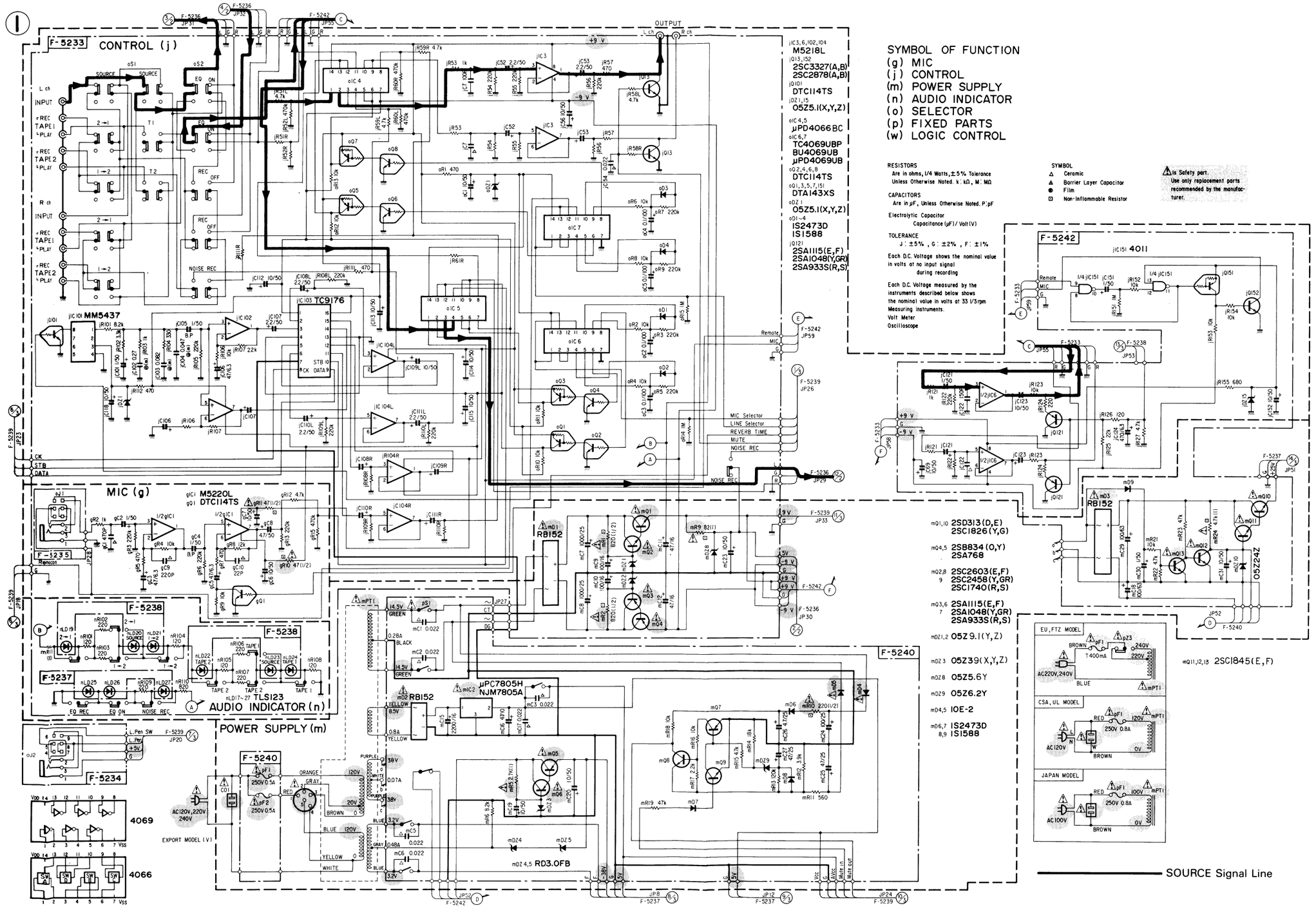
Each D.C. Voltage shows the nominal value in volts at no input signal during recording

Each D.C. Voltage measured by the instruments described below shows the nominal value in volts at 33 1/3rpm
Measuring instruments.
Volt Meter
Oscilloscope

SYMBOL
△ Ceramic
▲ Barrier Layer Capacitor
● Film
⊡ Non-Inflammable Resistor

⚠ is Safety part. Use only replacement parts recommended by the manufacturer.

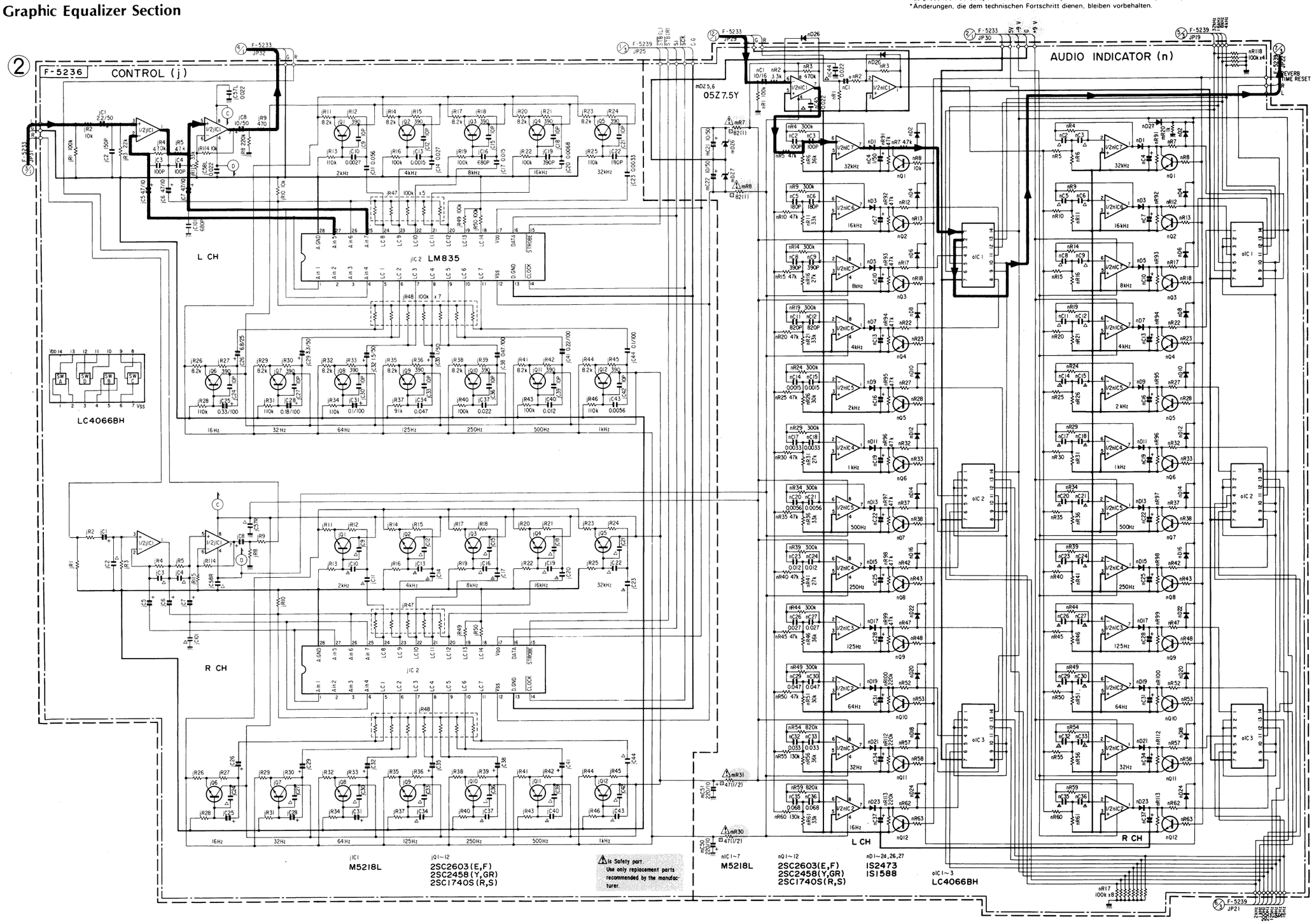
2SC1845 2SB834
2SC2320L 2SC1826
2SA1048 2SA933S
2SA1115 2SC1740S
2SC2458 2SC3327
2SC2603
DTA114TS
DTA143XS
2SD313
μPC7805H
NJM7805A
M5231L
μPD1511AC
μPD4011BC
μPD4066BC
μPD4069UB
μPD7811CW
BU4069UB
LC40668H
LMC835N
MM5437N
TC4069UBP
TC9176P
M5218L
M5220L
1S1588
1S2473
10E2
RB-152
05Z5.6
RD3.0F
TLS-123



| A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|

*Design and specifications subject to change without notice for improvement.
*La présention et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
*Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

## 8-2. Graphic Equalizer Section

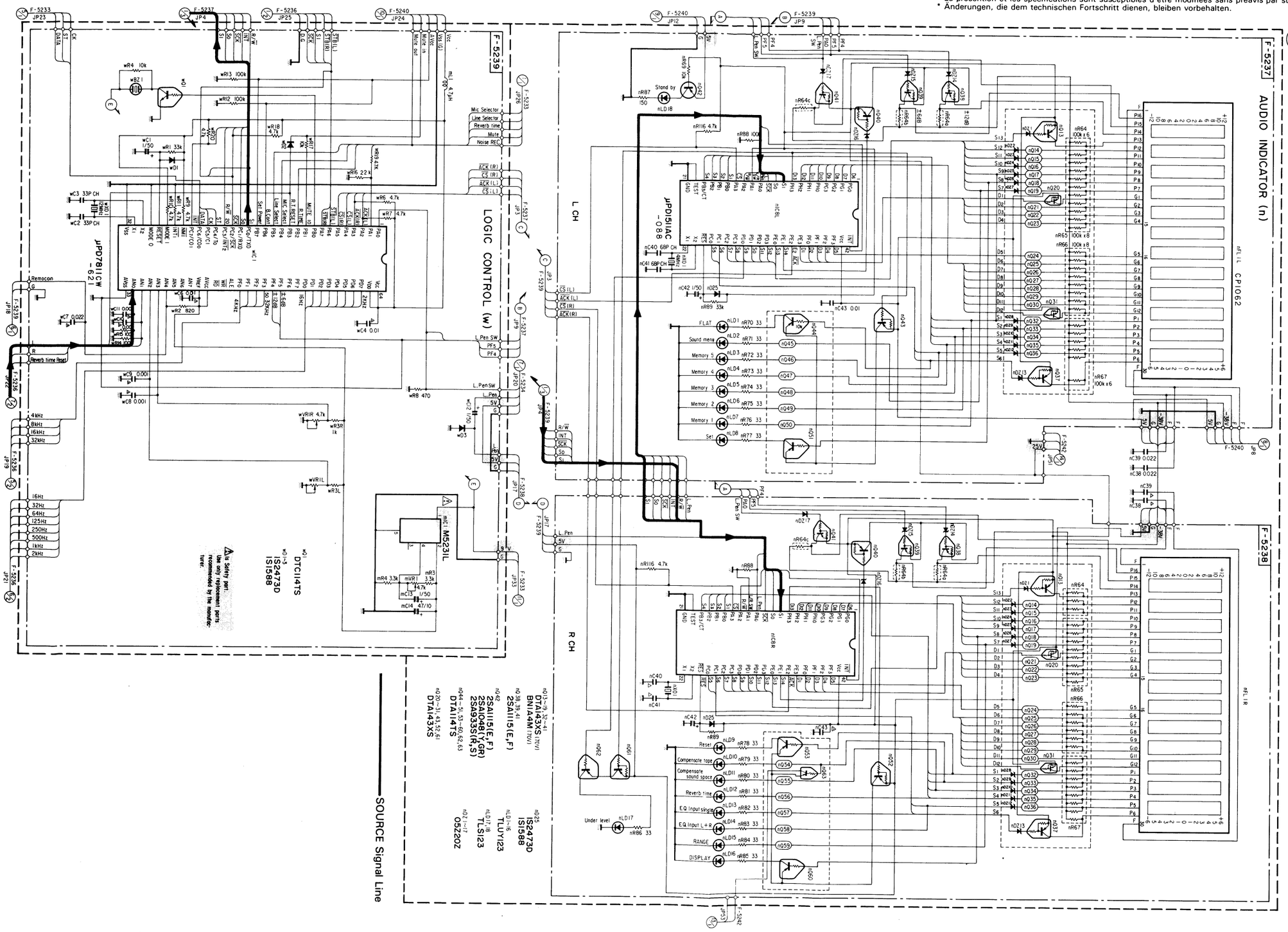



2SC1845 2SB834
2SC2320L 2SC1826
2SA1048
2SA1115
2SC2458
2SC2603
DTA114TS
DTA143XS
2SA933S
2SC1740S
2SC3327
2SD313
µPC7805H
NJM7805A
M5231L
µPD1511AC
µPD4011BC
µPD4066BC
µPD4069UB
µPD7811CW
BU4069UB
LC4066BH
LMC835N
MM5437N
TC4069UBP
TC9176P
M5218L
M5220L
1S1588
1S2473
1OE2
RB-152
05Z5.6
RD3.0F
TLS-123

| A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|

## 8-3. Microcomputer Section

* Design and specifications subject to change without notice for improvement.
* La présention et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
* Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.




2SC1845 2SB834
2SC2320L 2SC1826

2SA1048
2SA1115
2SC2458
2SC2603
DTA114TS
DTA143XS

2SA933S
2SC1740S
2SC3327

2SD313

μPC7805H
NJM7805A

M5231L

1:INPUT(V+)
2:OUTPUT
3:GND

μPD1511AC
μPD4011BC
μPD4066BC
μPD4069UB
μPD7811CW
BU4069UB
LC4066BH
LMC835N
MM5437N
TC4069UBP
TC9176P

Dot or Slit or Line

M5218L
M5220L

1S1 588
1S2 473
10E2

RB-152

05Z5.6
RD3.0F

TLS-123

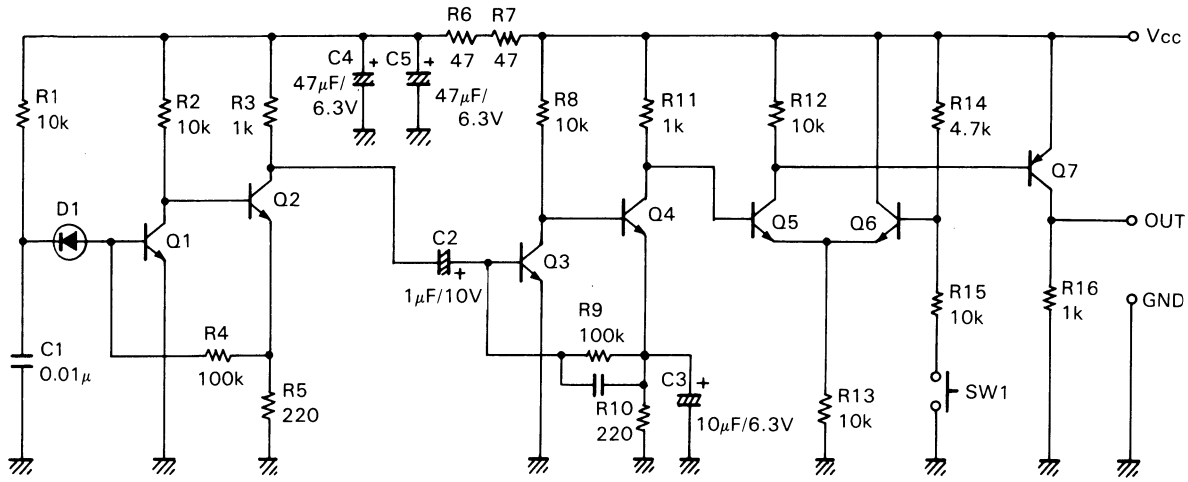
⚠ Is Safety part.
Use only replacement parts recommended by the manufacturer.

nQ1 DTC114TS
nQ3~5 IS2473D
IS1588

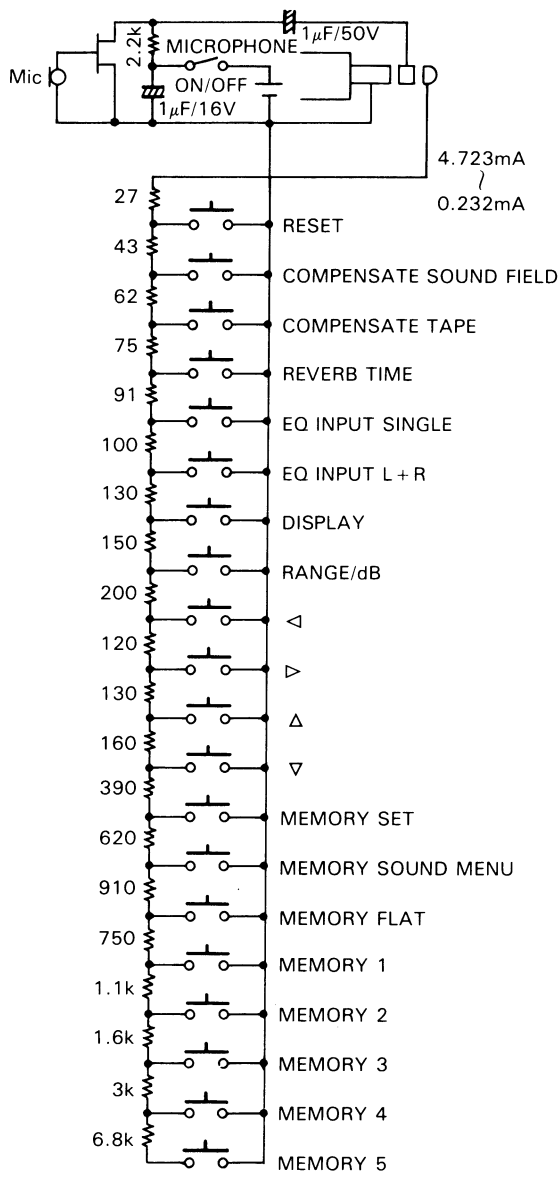
nQ13~19, 32~41 DTA143XS (TOY)
BN1A4M (TOY)
nQ38, 39, 41 2SA1115(E,F)
nQ42 2SA1115(E,F)
2SA1048(Y,GR)
2SA933S(R,S)
nQ44~51, 53~60, 62, 63 DTA114TS
nQ20~31, 43, 52, 61 DTA143XS

nQ25 IS2473D
IS1588
nLD1~16 TLUY123
nLD17,18 TLSI23
nDZ1~17 052Z0Z

## 8-4. COMPU-EQUALIZER LIGHT PEN LP-99




## 8-5. REMOTE CONTROL MICROPHONE RE-99



Sansui

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